Audit Report

YEAR 2000 COMPLIANCE OF THE *SEAWOLF* CLASS
SUBMARINE COMBAT SYSTEM

Report No. 99-146   May 3, 1999

Office of the Inspector General
Department of Defense

Acronym

Y2K   Year 2000

May 3, 1999

MEMORANDUM FOR COMMANDER IN CHIEF, U.S. ATLANTIC COMMAND
COMMANDER IN CHIEF, U.S. PACIFIC COMMAND
ASSISTANT SECRETARY OF THE NAVY (FINANCIAL
MANAGEMENT AND COMPTROLLER)

SUBJECT: Audit Report on Year 2000 Compliance of the Seawolf Class Submarine
Combat System (Report No. 99-146)

We are providing this report for your information and use. This is one in a
series of reports being issued by the Inspector General, DoD, in accordance with an
informal partnership with the Chief Information Officer, DoD, to monitor efforts to
address the year 2000 computing challenge. Because this report contains no findings or
recommendations, no written comments were required, and none were received.
Therefore, we are publishing this report in final form.

We appreciate the courtesies extended to the audit staff. Questions on the audit
should be directed to Mr. Joseph Doyle at (703) 604-9348 (DSN 664-9348) or
Mr. John Yonaitis, at (703) 604-9340 (DSN 664-9340). See Appendix B for the report
distribution. The audit team members are listed inside the back cover.

Robert J. Lieberman
Assistant Inspector General
for Auditing

Office of the Inspector General, DoD

Report No. 99-146
(Project No. 9CC-0086.02)

May 3, 1999

Year 2000 Compliance of the *Seawolf* Class Submarine Combat System

Executive Summary

Introduction. This is one in a series of reports being issued by the Inspector General, DoD, in accordance with an informal partnership with the Chief Information Officer, DoD, to monitor DoD efforts to address the year 2000 computing challenge. For a list of audit projects addressing the issue, see the year 2000 web page on the IGnet at http://www.ignet.gov.

Objectives. The overall audit objective was to assess the status of Military Department and Defense agency mission critical systems identified by the U.S. Pacific Command and U.S. Forces Korea as being of particular importance to them in attaining compliance with year 2000 conversion requirements. Specifically, we reviewed the progress of each system toward year 2000 compliance, testing and integration of modifications, and contingency plans. For this report, we reviewed the *Seawolf* Class Submarine Combat System.

Results. The *Seawolf* Class Submarine Combat System was appropriately certified as year 2000 compliant for both software and hardware in December 1998. The combat system program manager followed the Navy certification process and documented the system verification, testing, interfaces, implementation, and contingency management plan before certification. The implementation of the *Seawolf* Class Submarine Combat System software upgrade is on schedule for the *Seawolf* submarines.

Management Comments. We provided a draft of this report on April 9, 1999. Because this report contains no findings or recommendations, written comments were not required, and none were received. Therefore, we are publishing the report in final form.

Table of Contents

Background

The Executive Order, "Year 2000 Conversion," February 4, 1998, mandates that Federal agencies do what is necessary to ensure that no critical Federal program experiences disruption because of the year 2000 (Y2K) computing problem. The Executive Order also requires that the head of each agency ensure that efforts to address Y2K issues receive the highest priority.

The Assistant Secretary of Defense (Command, Control, Communications and Intelligence) is the principal staff assistant responsible for the DoD Y2K Management Plan. The DoD Y2K Management Plan, version 2, December 1998, provides guidance for testing and certifying systems and preparing contingency plans for those systems, and stipulates the criteria that DoD Components must use to meet reporting requirements.

The U.S. Navy year 2000 Action Plan, September 1998, provides the guidance for planning and implementing all information technology, software and systems in the Department of the Navy that face a Y2K problem. The Navy has direct responsibility for ensuring the Y2K readiness of the *Seawolf* Class Submarine Combat System (AN/BSY-2).

The AN/BSY-2 is a fully integrated submarine combat system for the *Seawolf* submarines. The AN/BSY-2 consists of an acoustic subsystem, a command and decision subsystem, and a weapon subsystem. The system provides contact correlation, detection, classification, and passive ranging and tracking for the *Seawolf* submarines. It also provides target motion analysis, contact management, and weapons control and management.

Objectives

The overall objective was to assess the status of Military Department and Defense agency mission critical systems, identified by the U.S. Pacific Command and U.S. Forces Korea as being of particular importance to them, in attaining compliance with year 2000 conversion requirements. Specifically, we reviewed the progress of each system toward year 2000 compliance, testing and integration of modifications, and contingency management plans. For this report, we reviewed the *Seawolf* Class Submarine Combat System (AN/BSY-2).

Year 2000 Compliance of the *Seawolf* Class Submarine Combat System

The *Seawolf* Class Submarine Combat System (AN/BSY-2) was appropriately certified as year 2000 compliant for both software and hardware in December 1998. The AN/BSY-2 program manager followed the Navy certification process and documented the verification, testing, interfaces, implementation, and contingency management plan before certification of the AN/BSY-2. As a result, the Navy has minimized the risk of year 2000 failure of the AN/BSY-2. The implementation of the AN/BSY-2 software upgrade is on schedule for the *Seawolf* submarines.

Y2K Compliance of the AN/BSY-2

The Strategic and Attack Submarine program office, a part of the Naval Sea Systems Command, is responsible for the AN/BSY-2 with oversight from Headquarters, Department of the Navy. The Naval Undersea Warfare Center, Newport Division, Newport, Rhode Island, conducted the year 2000 tests of the AN/BSY-2 and the systems which interface with AN/BSY-2 in July and November 1998 and certified the system year 2000 compliant on December 1, 1998.

Testing of the AN/BSY-2. The Naval Undersea Warfare Center, Newport Division performed the preliminary software tests of the AN/BSY-2 by using current date information. Those tests verified that all applicable tools would work during Y2K testing. Next, the date changeover was tested to identify any potential problems. That test included system date/time rollover, and date entry to test the ability of the system to perform in the year 2000 and beyond. The AN/BSY-2 passed the tests and was determined to be Y2K compliant.

Interfaces for the AN/BSY-2. The AN/BSY-2 interfaces with 21 other systems. However, the AN/BSY-2 only passes Y2K data to 5 of the 21 systems. The five systems are the Data Recording Set, the Tactical Support Device, the Joint Maritime Combat Information System, the Ship Control System, and the Tomahawk Cruise Missile Land Attack Guidance System. The Naval Undersea Warfare Center, Newport Division successfully conducted the Y2K interface date/time rollover data entry tests on the five systems in July 1998 and determined them to be Y2K compliant with the AN/BSY-2.

Implementation Plan

The implementation of the AN/BSY-2 software is determined by the availability of the submarine. The AN/BSY-2 software upgrade is scheduled to be implemented on three *Seawolf* submarines, the *Seawolf* (SSN-21), the *Connecticut* (SSN-22), and the *Jimmy Carter* (SSN-23). The AN/BSY-2 software upgrade is scheduled to be implemented on the SSN-22 in May 1999, and on the SSN-21 in June 1999. The AN/BSY-2 hardware had been installed on the SSN-21 and SSN-22 when they were constructed. The SSN-23 is being constructed and the AN/BSY-2 hardware and software will be implemented on that submarine after year 2000.

Contingency Management Plan

The AN/BSY-2 program manager identified risks to the AN/BSY-2 and developed a series of contingency management plans aimed at correcting potential problems that could occur. The contingency management plans covered procedures for invoking and operating in a contingency operating mode, procedures for returning to normal operating mode, and procedures for recovering lost or damaged data. The plans listed specific risks, the probability of occurrence and the corrective action to be taken.

Conclusion

The AN/BSY-2 program manager complied with DoD and Navy guidance in processing the AN/BSY-2 Y2K certification. The AN/BSY-2 has been determined to be Y2K compliant. The AN/BSY-2 program manager is on schedule to implement the AN/BSY-2 software upgrade on the *Seawolf* submarines. Therefore, we have no recommendations.

Appendix A. Audit Process

This is one in a series of reports being issued by the Inspector General, DoD, in accordance with an informal partnership with the Chief Information Officer, DoD, to monitor DoD efforts to address the year 2000 computing challenge. For a list of audit projects addressing the issue, see the Y2K web page on the IGnet at http://www.ignet.gov.

Scope

We reviewed and evaluated the AN/BSY-2. We visited the Naval Sea Systems Command program office responsible for the AN/BSY-2 and met with officials to obtain the year 2000 status of the mission critical system. During our meetings, we obtained data pertaining to the AN/BSY-2.

DoD-wide Corporate Level Government Performance and Results Act Goals. In response to the Government Performance Results Act, the Department of Defense has established 6 DoD-wide corporate level performance objectives and 14 goals for meeting these objectives. This report pertains to achievement of the following objectives and goals.

- **Objective:** Prepare now for an uncertain future. **Goal:** Pursue a focused modernization effort that maintains U.S. qualitative superiority in key war fighting capabilities. **(DoD-3)**

DoD Functional Area Reform Goals. Most major DoD functional areas have also established performance improvement reform objectives and goals. This report pertains to achievement of the following functional area objectives and goals.

- **Information Technology Management Functional Area.**
  Objective: Become a mission partner.
  Goal: Serve mission information users as customers. **(ITM-1.2)**

- **Information Technology Management Functional Area.**
  Objective: Provide services that satisfy customer information needs.
  Goal: Modernize and integrate DoD information infrastructure.
  (ITM 2.2)

- **Information Technology Management Functional Area.**
  Objective: Provide services that satisfy customer information needs.
  Goal: Upgrade technology base. **(ITM-2.3)**

General Accounting Office High-Risk Area. In its identification of high-risk areas, the General Accounting Office has specifically designated risk in resolution of the Y2K problem as high. This report provides coverage of that problem and the overall Information Management and Technology high-risk area.

Methodology

Audit Type, Dates, and Standard. We performed this program audit in March 1999 in accordance with auditing standards issued by the Comptroller General of the United States, as implemented by the Inspector General, DoD. We did not use computer-processed data to perform this audit.

Contacts During the Audit. We visited or contacted individuals and organizations within DoD. Further details are available upon request.

Management Control Program. We did not review the management control program related to the overall audit objective because DoD recognized the Y2K issue as a material management control weakness area in the FY 1997 Annual Statement of Assurance.

Summary of Prior Coverage

The General Accounting Office and the Inspector General, DoD, have conducted multiple reviews related to the Y2K issues. General Accounting Office reports can be accessed over the internet at http://www.gao.gov. Inspector General, DoD, reports can be accessed over the Internet at http://www.dodig.osd.mil.

Appendix B. Report Distribution

Office of the Secretary of Defense

Under Secretary of Defense for Acquisition and Technology
    Director, Defense Logistics Studies Information Exchange
Under Secretary of Defense (Comptroller)
    Deputy Chief Financial Officer
    Deputy Comptroller (Program/Budget)
Under Secretary of Defense for Personnel and Readiness
Assistant Secretary of Defense (Command, Control, Communications, and Intelligence)
    Deputy Assistant Secretary of Defense (Command, Control, Communications,
      Intelligence, Surveillance, Reconnaissance, and Space Systems)
    Deputy Chief Information Officer and Deputy Assistant Secretary of Defense (Chief
      Information Officer Policy and Implementation)
      Principal Deputy – Y2K
Assistant Secretary of Defense (Public Affairs)

Joint Staff

Director, Joint Staff

Department of the Army

Assistant Secretary of the Army (Financial Management and Comptroller)
Auditor General, Department of the Army
Chief Information Officer, Army

Department of the Navy

Assistant Secretary of the Navy (Financial Management and Comptroller)
Auditor General, Department of the Navy
Chief Information Officer, Navy
Commander, Naval Sea Systems Command

Department of the Air Force

Assistant Secretary of the Air Force (Financial Management and Comptroller)
Auditor General, Department of the Air Force
Chief Information Officer, Air Force

Unified Command

Commander in Chief, U.S. European Command
Commander in Chief, U.S. Pacific Command
Commander in Chief, U.S. Atlantic Command
Commander in Chief, U.S. Central Command
Commander in Chief, U.S. Special Operations Command

Other Defense Organizations

Director, Defense Information Systems Agency
    Chief Information Officer, Defense Information Systems Agency
    Inspector General, Defense Information Systems Agency
    United Kingdom Liaison Officer, Defense Information Systems Agency
Director, National Security Agency
    Inspector General, National Security Agency
Inspector General, Defense Intelligence Agency
Inspector General, National Imagery and Mapping Agency
Inspector General, National Reconnaissance Office

Non-Defense Federal Organizations and Individuals

Office of Management and Budget
General Accounting Office
    National Security and International Affairs Division,
        Technical Information Center,
    Accounting and Information Management Division
        Director, Defense Information and Financial Management Systems

Congressional Committees and Subcommittees, Chairman and Ranking Minority Member

Senate Committee on Appropriations
Senate Subcommittee on Defense, Committee on Appropriations
Senate Committee on Armed Services
Senate Committee on Governmental Affairs
Senate Special Committee on the Year 2000 Technology Problem
Senate Committee on Intelligence
House Committee on Appropriations
House Subcommittee on National Security, Committee on Appropriations
House Committee on Armed Services
House Committee on Government Reform
House Subcommittee on Government Management, Information, and Technology,
    Committee on Government Reform
House Subcommittee on National Security, Veterans Affairs, and International
    Relations, Committee on Government Reform
House Subcommittee on Technology, Committee on Science
House Permanent Select Committee on Intelligence

Audit Team Members

The Contract Management Directorate, Office of the Assistant Inspector General for Auditing, DoD, produced this report. Personnel of the Office of the Inspector General, DoD, who contributed to the report are listed below.

Paul J. Granetto
Joseph Doyle
John Yonaitis
Gopal Jain
John Huddleston